



**United States
Department of
Agriculture**

**Agricultural
Marketing
Service**

**Fruit and
Vegetable
Division**

**Fresh
Products
Branch**

United States Standards for Grades of Apples

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United States Standards for Grades of Apples ¹

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¹ Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug and Cosmetic Act, or with applicable State laws and regulations.

Grades

§51.300 U.S. Extra Fancy.

"U.S. Extra Fancy" consists of apples of one variety which are mature but not overripe, carefully hand-picked, clean, fairly well formed; free from decay, internal browning, internal breakdown, scald, scab, bitter pit, Jonathan spot, freezing injury, visible water core, and broken skins and bruises except those which are slight and incident to proper handling and packing. The apples are also free from injury caused by smooth net-like russetting, sunburn or sprayburn, limb rubs, hail, drought spots, scars, disease, insects, or other means; and free from damage by smooth solid, slightly rough or rough russetting, or stem or calyx cracks, and free from damage by invisible water core after January 31st of the year following the year of production. Each apple of this grade has the amount of color specified in §51.305 for the variety. (See §§51.305 and 51.307.)

§51.301 U.S. Fancy.

"U.S. Fancy" consists of apples of one variety which are mature but not overripe, carefully hand-picked, clean, fairly well formed; free from decay, internal browning, internal breakdown, bitter pit, Jonathan spot, scald, freezing injury, visible water core, and broken skins and bruises except those which are incident to proper handling and packing. The apples are also free from damage caused by russetting, sunburn or sprayburn, limb rubs, hail, drought spots, scars, stem or calyx cracks, disease, insects, invisible water core after January 31st of the year following the year of production, or damage by other means. Each apple of this grade has the amount of color specified in §51.305 for the variety. (See §§51.305 and 51.307.)

§51.302 U.S. No. 1.

The requirements of this grade are the same as for U.S. Fancy except for color, russetting, and invisible water core. In this grade less color is required for all varieties with the exception of the yellow and green varieties other than Golden Delicious. Apples of this grade are free from excessive damage caused by russetting which means that apples meet the russetting requirements for U.S. Fancy as defined under the definitions of "damage by russetting", except the aggregate area of an apple which may be covered by smooth net-like russetting shall not exceed 25 percent; and the aggregate area of an apple which may be covered by smooth solid russetting shall not exceed 10 percent: **Provided**, That in the case of the Yellow Newtown or similar varieties the aggregate area of an apple which may be covered with smooth solid russetting shall not exceed 20 percent. Each apple of this grade has the amount of color specified in §51.305 for the variety. There is no requirement in this grade pertaining to invisible water core. (See §§51.305 and 51.307.)

(a) **U.S. No. 1 Early:** "U.S. No. 1 Early" consists of apples which meet the requirements of U.S. No. 1 grade except as to color and maturity, and meet a minimum size requirement. Apples of this grade have no color requirements, need not be mature, and are not less than 2 inches in diameter. This grade is provided for varieties such as Duchess, Gravenstein, Red June, Twenty Ounce, Wealthy, Williams, Yellow Transparent, and Lodi, or other varieties which are normally marketed during the summer months. (See §51.307.)

(b) **U.S. No. 1 Hail:** "U.S. No. 1 Hail" consists of apples which meet the requirements of U.S. No. 1 grade except that hail marks where the skin has not been broken, and well healed hail marks where the skin has been broken, are permitted, provided the apples are fairly well formed. (See §§51.305 and 51.307.)

§51.303 U.S. Utility.

"U.S. Utility" consists of apples of one variety which are mature but not overripe, carefully hand-picked, not seriously deformed; free from decay, internal browning, internal breakdown, scald, and freezing injury. The apples are also free from serious damage caused by dirt or other foreign matter, broken skins, bruises, russeting, sunburn or sprayburn, limb rubs, hail, drought spots, scars, stem or calyx cracks, visible water core, disease, insects, or other means. (See §51.307.)

§51.304 Combination grades.

(a) Combinations of the above grades may be used as follows:

- (1) Combination U.S. Extra Fancy and U.S. Fancy;
- (2) Combination U.S. Fancy and U.S. No. 1;
- (3) Combination U.S. No. 1 and U.S. Utility.

(b) Combinations other than these are not permitted in connection with the U.S. apple grades. When Combination grades are packed, at least 50 percent of the apples in any lot shall meet the requirements of the higher grade in the combination. (See §51.307.)

Color Requirements

§51.305 Color requirements.

In addition to the requirement specified for the grades set forth in §§51.300 to 51.304 apples of these grades shall have the percentage of color specified for the variety in Table I appearing in this section. For the solid red varieties the percentage stated refers to the area of the surface which must be covered with a good shade of solid red characteristic of the variety: **Provided**, That an apple having color of a lighter shade of solid red or striped red than that considered as a good shade of red characteristic of the variety may be admitted to a grade, provided it has sufficient additional area covered so that the apple has as good an appearance as one with the minimum percentage of good red characteristic of the variety required for the grade. For the striped red varieties the percentage stated refers to the area of the surface in which the stripes of a good shade of red characteristic of the variety shall predominate over stripes of lighter red, green, or yellow. However, an apple having color of a lighter shade than that considered as a good shade of red characteristic of the variety may be admitted to a grade, provided it has sufficient additional area covered so that the apple has as good an appearance as one with the minimum percentage of stripes of a good red characteristic of the variety required for the grade. Faded brown stripes shall not be considered as color except in the case of the Gray Baldwin variety.

(a) Color standards USDA Visual Aid APL-L-1 (including plates (A), (B), (C), (D), (E), and (F)) consist of a folder containing the color requirements for apples set forth in this section and five plates illustrating minimum good shade of solid red or striped red color, minimum compensating color and a shade not considered color, for Red Delicious, Winesap, Delicious, McIntosh, and Jonathan varieties, and one plate illustrating minimum white or light green color and characteristic color for the Golden Delicious variety. These color standards may be examined in the Fruit and Vegetable Division, AMS, U.S. Department of Agriculture, South Building, Washington, D.C. 20250; in any field office of the Fresh Fruit and Vegetable Inspection Service; or upon request of any authorized inspector of such Service. Duplicates of the color standards may be purchased from the John Henry Co., Post Office Box 1410, Lansing, MI 48904.

**Table I -- Color Requirements for Specified U.S.
Grades of Apples by Variety**

Variety	U.S. Extra Fancy	U.S. Fancy	U.S. No. 1
Solid Red:	Percent	Percent	Percent
Black Ben	66	40	25
Gano	66	40	25
Winesap	66	40	25
Other similar varieties ¹	66	40	25
Red Sport Varieties ²	66	40	25
Striped or partially red:			
Jonathan	66	33	25
McIntosh	50	33	25
Cortland	50	33	25
Other similar varieties ³	50	33	25
Rome Beauty	50	33	15
Stayman	50	33	15
York Imperial	50	33	15
Baldwin	50	25	15
Ben Davis	50	25	15
Delicious	50	25	15
Mammoth Black Twig	50	25	15
Turley	50	25	15
Wagner	50	25	15
Wealthy	50	25	15
Willow Twig	50	25	15
Northern Spy	50	25	15
Other similar varieties ⁴	50	25	15
Hubbardston	50	15	10
Stark	50	15	10
Other similar varieties	50	15	10
Red June	50	15	(⁵)
Red Gravenstein	50	15	(⁵)
Williams	50	15	(⁵)
Other similar varieties	50	15	(⁵)
Gravenstein	25	10	(⁵)
Duchess	25	10	(⁵)
Other similar varieties ⁶	25	10	(⁵)

¹Arkansas Black, Beacon, Detroit Red, Esopus Spitzenburg, King David, Lowry, Minjon.

²When Red Sport varieties are specified as such they shall meet the color requirements specified for Red Sport varieties.

³Haralson, Kendall, Macoun, Snow (Fameuse).

⁴Bonum, Early McIntosh, Limbertwig, Milton, Nero, Paragon, Melba.

⁵Tinge of color.

⁶Red Astrachan, Smokehouse, Summer Rambo, Dudley.

Red checked or blushed:	Percent	Percent	Percent
Malden Blush	(⁷)	(⁵)	(⁸)
Twenty Ounce	(⁷)	(⁵)	(⁸)
Winter Banana	(⁷)	(⁵)	(⁸)
Other similar varieties	(⁷)	(⁵)	(⁸)
Green varieties	(⁹)	(⁹)	(⁹)
Yellow varieties	(⁹)	(⁹)	(⁹)
Golden Delicious	(¹⁰)	(¹⁰)	(⁹)

⁵Tinge of color.

⁷Blush Cheek.

⁸None.

⁹Characteristic ground color.

¹⁰75 percent or more of the surface of the apple shall show white or light green predominating over the green color.

Unclassified

§51.306 Unclassified.

"Unclassified" consists of apples which have not been classified in conformity with any of the foregoing grades. The term "unclassified" is not a grade within the meaning of these standards but is provided as a designation to show that no definite grade has been applied to the lot.

Tolerances

§51.307 Tolerances.

In order to allow for variations incident to proper grading and handling in each of the foregoing grades the following tolerances are provided as specified:

(a) Defects: (1) U.S. Extra Fancy, U.S. Fancy, U.S. No. 1, U.S. No. 1 Early and U.S. No. 1 Hail grades: 10 percent of the apples in any lot may fail to meet the requirements of the grade, but not more than one-half of this amount, or 5 percent, shall be allowed for apples which are seriously damaged, including therein not more than 1 percent for apples affected by decay or internal breakdown.

(2) U.S. Utility grade: 10 percent of the apples in any lot may fail to meet the requirements of the grade, but not more than one-half of this amount, or 5 percent, shall be allowed for apples which are seriously damaged by insects, and including in the total tolerance not more than 1 percent for apples affected by decay or internal breakdown.

(b) When applying the foregoing tolerances to Combination grades no part of any tolerance shall be allowed to reduce, for the lot as a whole, the 50 percent of apples of the higher grade required in the combination but individual containers shall have not less than 40 percent of the higher grade.

(c) Size: When size is designated by the numerical count for a container, not more than 5 percent of the apples in the lot may vary more than 1/4 inch in diameter. When size is designated by minimum or maximum diameter, not more than 5 percent of the apples in any lot may be smaller than the designated minimum and not more than 10 percent may be larger than the designated maximum.

Application of Tolerances

§51.308 Application of tolerances.

The contents of individual packages in the lot, are subject to the following limitations: **Provided,**

That the averages for the entire lot are within the tolerances specified for the grade:

(a) Packages which contain more than 10 pounds:

(1) Shall have not more than one and one-half times a specified tolerance of 10 percent or more and not more than double a tolerance of less than 10 percent, except that at least one apple which is seriously damaged by insects or affected by decay or internal breakdown may be permitted in any package.

(b) Packages which contain 10 pounds or less:

(1) Not over 10 percent of the packages may have more than three times the tolerance specified, except that at least one defective apple may be permitted in any package: **Provided**, That not more than one apple or more than 6 percent (whichever is the larger amount) may be seriously damaged by insects or affected by decay or internal breakdown.

Calculation of Percentages

§51.309 Calculation of percentages.

(a) When the numerical count is marked on the container, percentages shall be calculated on the basis of count.

(b) When the minimum diameter or minimum and maximum diameters are marked on a container or when the apples are jumbled in a container or in bulk, percentages shall be calculated on the basis of weight or an equivalent basis.

Condition After Storage or Transit

§51.310 Condition after storage or transit.

(a) Decay, scald or any other deterioration which may have developed on apples after they have been in storage or transit shall be considered as affecting condition and not the grade.

Packing Requirements

§51.311 Packing requirements.

(a) Apples tray packed or cell packed in cartons shall be arranged according to approved and recognized methods. Packs shall be at least fairly tight¹ or fairly well filled.²

(b) Closed cartons containing apples not tray or cell packed shall be fairly well filled² or the pack shall be sufficiently tight to prevent any appreciable movement of the apples.

(c) Packs in wooden boxes or baskets shall be sufficiently tight to prevent any appreciable movement of apples within containers when the packages are closed. Each wrapped apple shall be completely enclosed by its individual wrapper.

(d) Apples on the shown face of any container shall be reasonably representative in size, color and quality of the contents.

(e) Tolerances: In order to allow for variations incident to proper packing, not more than 10 percent of the containers in any lot may fail to meet these requirements.

¹"Fairly tight" means that apples are of the proper size for molds or cell compartments in which they are packed, and that molds or cells are filled in such a way that no more than slight movement of apples within molds or cells is possible. The top layer of apples, or any pad or space filler over the top layer of apples shall be not more than 3/4 inch below the top edge of the carton.

²"Fairly well filled" means that the net weight of apples in containers ranging from 2,100 to 2,900 cubic inch capacity is not less than 37 pounds for Cortland, Gravenstein, Jonathan, McIntosh and Golden Delicious varieties and not less than 40 pounds for all other varieties.

Marking Requirements

§51.312 Marking requirements.

The numerical count or the minimum diameter of the apples packed in a closed container shall be indicated on the container.

- (a) When the numerical count is not shown, the minimum diameter shall be plainly stamped, stenciled or otherwise marked on the container in terms of whole inches, or whole inches and not less than eighth inch fractions thereof.
- (b) The word "minimum", or its abbreviation, when following a diameter size marking, means that the apples are of the size marked or larger. (See §§51.307 and 51.308.)

Definitions

§51.313 Mature.

"Mature" means that the apples have reached the stage of development which will insure the proper completion of the ripening process. Before a mature apple becomes overripe it will show varying degrees of firmness, depending upon the stage of the ripening process. The following terms are used for describing different stages of firmness of apples:

- (a) "Hard" means apples with a tenacious flesh and starchy flavor.
- (b) "Firm" means apples with a tenacious flesh but which are becoming crisp with a slightly starchy flavor, except the Delicious variety.
- (c) "Firm ripe" means apples with crisp flesh except that the flesh of the Gano, Ben Davis, and Rome Beauty varieties may be slightly mealy.
- (d) "Ripe" means apples with mealy flesh and soon to become soft for the variety.

§51.314 Overripe.

"Overripe" means apples which are dead ripe, with flesh very mealy or soft, and past commercial utility.

§51.315 Carefully hand-picked.

"Carefully hand-picked" means that the apples do not show evidence of rough handling or of having been on the ground.

§51.316 Clean.

"Clean" means that the apples are free from excessive dirt, dust, spray residue and other foreign material.

§51.317 Fairly well formed.

"Fairly well formed" means that the apple may be slightly abnormal in shape but not to an extent which detracts materially from its appearance.

§51.318 Injury.

"Injury" means any specific defect defined in this section; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which more than slightly detracts from the appearance, or the edible or shipping quality of the apple. The following specific defects shall be considered as injury:

- (a) Russetting in the stem cavity or calyx basin which cannot be seen when the apple is placed stem end or calyx end down on a flat surface shall not be considered in determining whether or not an apple is injured by russetting. Smooth net-like russetting outside of the stem cavity or calyx basin shall be considered as injury when an aggregate area of more than 10 percent of the surface is covered, and the color of the russetting shows no very pronounced contrast with the background

color of the apple, or lesser amounts of more conspicuous net-like russetting when the appearance is affected to a greater extent than the above amount permitted.

(b) Sunburn or sprayburn, when the discolored area does not blend into the normal color of the fruit.

(c) Dark brown or black limb rubs which affect a total area of more than one-fourth inch in diameter, except that light brown limb rubs of a russet character shall be considered under the definition of injury by russetting.³

(d) Hail marks, drought spots, other similar depressions or scars:

(1) When the skin is broken, whether healed or unhealed;

(2) When there is appreciable discoloration of the surface;

(3) When any surface indentation exceeds one-sixteenth inch in depth;

(4) When any surface indentation exceeds one-eighth inch in diameter; or,

(5) When the aggregate affected area of such spots exceeds one-half inch in diameter.³

(e) Disease: (1) Cedar rust infection which affects a total area of more than three-sixteenths inch in diameter.³

(2) Sooty blotch or fly speck which is thinly scattered over more than 5 percent of the surface, or dark, heavily concentrated spots which affect an area of more than one-fourth inch in diameter.³

(3) Red skin spots which are thinly scattered over more than one-tenth of the surface, or dark, heavily concentrated spots which affect an area of more than one-fourth inch in diameter.³

(f) Insects: (1) Any healed sting or healed stings which affect a total area of more than one-eighth inch in diameter including any encircling discolored rings.³

(2) Worm holes.

§51.319 Damage.

"Damage" means any specific defect defined in this section; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which materially detracts from the appearance, or the edible or shipping quality of the apple. The following specific defects shall be considered as damage:

(a) Russetting in the stem cavity or calyx basin which cannot be seen when the apple is placed stem end or calyx end down on a flat surface shall not be considered in determining whether or not an apple is damaged by russetting, except that excessively rough or bark-like russetting in the stem cavity or calyx basin shall be considered as damage when the appearance of the apple is materially affected. The following types and amounts of russetting outside of the stem cavity or calyx basin shall be considered as damage:

(1) Russetting which is excessively rough on Roxbury Russet and other similar varieties.

(2) Smooth net-like russetting, when an aggregate area of more than 15 percent of the surface is covered, and the color of the russetting shows no very pronounced contrast with the background color of the apple, or lesser amounts of more conspicuous net-like russetting when the appearance is affected to a greater extent than the above amount permitted.

(3) Smooth solid russetting, when an aggregate area of more than 5 percent of the surface is covered, and the pattern and color of the russetting shows no very pronounced contrast with the background color of the apple, or lesser amounts of more conspicuous solid russetting when the

³ The area refers to that of a circle of the specified diameter.

appearance is affected to a greater extent than the above amount permitted.

(4) Slightly rough russeting which covers an aggregate area of more than one-half inch in diameter.³

(5) Rough russeting which covers an aggregate area of more than one-fourth inch in diameter.³

(b) Sunburn or sprayburn which has caused blistering or cracking of the skin, or when the discolored area does not blend into the normal color of the fruit unless the injury can be classed as russeting.

(c) Limb rubs which affect a total area of more than one-half inch in diameter, except that light brown limb rubs of a russet character shall be considered under the definition of damage by russeting.³

(d) Hail marks, drought spots, other similar depressions or scars:

(1) When any unhealed mark is present;

(2) When any surface indentation exceeds one-eighth inch in depth;

(3) When the skin has not been broken and the aggregate affected area exceeds one-half inch in diameter;³ or,

(4) When the skin has been broken and well healed, and the aggregate affected area exceeds one-fourth inch in diameter.³

(e) Stem or calyx cracks which are not well healed, or well healed stem or calyx cracks which exceed an aggregate length of one-fourth inch.

(f) Invisible water core existing around the core and extending to water core in the vascular bundles; or surrounding the vascular bundles when the affected areas surrounding three or more vascular bundles meet or coalesce; or existing in more than slight degree outside the circular area formed by the vascular bundles.

(g) Disease: (1) Scab spots which affect a total area of more than one-fourth inch in diameter.³

(2) Cedar rust infection which affects a total area of more than one-fourth inch in diameter.³

(3) Sooty blotch or fly speck which is thinly scattered over more than one-tenth of the surface, or dark, heavily concentrated spots which affect an area of more than one-half inch in diameter.³

(4) Red skin spots which are thinly scattered over more than one-tenth of the surface, or dark, heavily concentrated spots which affect an area of more than one-half inch in diameter.³

(h) Insects: (1) Any healed sting or healed stings which affect a total area of more than three-sixteenths inch in diameter including any encircling discolored rings.³

(2) Worm holes.

§51.320 Serious damage.

"Serious damage" means any specific defect defined in this section; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects which seriously detracts from the appearance, or the edible or shipping quality of the apple. The following specific defects shall be considered as serious damage:

(a) The following types and amounts of russeting shall be considered as serious damage:

(1) Smooth solid russeting, when more than one-half of the surface in the aggregate is covered,

³ The area refers to that of a circle of the specified diameter.

including any russetting in the stem cavity or calyx basin, or slightly rough, or excessively rough or bark-like russetting, which detracts from the appearance of the fruit to a greater extent than the amount of smooth solid russetting permitted: **Provided**, That any amount of russetting shall be permitted on Roxbury Russet and other similar varieties.

(b) Sunburn or sprayburn which seriously detracts from the appearance of the fruit.

(c) Limb rubs which affect more than one-tenth of the surface in the aggregate.

(d) Hail marks, drought spots, or scars, if they materially deform or disfigure the fruit, or if such defects affect more than one-tenth of the surface in the aggregate: **Provided**, That no hail marks which are unhealed shall be permitted and not more than an aggregate area of one-half inch shall be allowed for well healed hail marks where the skin has been broken.³

(e) Stem or calyx cracks which are not well healed, or well healed stem or calyx cracks which exceed an aggregate length of one-half inch.

(f) Visible water core which affects an area of more than one-half inch in diameter.³

(g) Disease: (1) Scab spots which affect a total area of more than three-fourths inch in diameter.³

(2) Cedar rust infection which affects a total area of more than three-fourths inch in diameter.³

(3) Sooty blotch or fly speck which affects more than one-third of the surface.

(4) Red skin spots which affect more than one-third of the surface.

(5) Bitter pit or Jonathan spot which is thinly scattered over more than one-tenth of the surface and does not materially deform or disfigure the fruit.

(h) Insects: (1) Healed stings which affect a total area of more than one-fourth inch in diameter including any encircling discolored rings.³

(2) Worm holes.

§51.321 Seriously deformed.

"Seriously deformed" means that the apple is so badly misshapen that its appearance is seriously affected.

§51.322 Diameter.

When measuring for minimum size, "diameter" means the greatest dimension of the apple measured at right angles to a line from stem to blossom end. When measuring for maximum size, "diameter" means the smallest dimension of the apple determined by passing the apple through a round opening in any position.

U.S. Condition Standards for Export

§51.323 U.S. Condition Standards for Export.⁴

(a) Not more than 5 percent of the apples in any lot shall be further advanced in maturity than firm ripe.

³ The area refers to that of a circle of the specified diameter.

⁴ These standards may be applied to domestic shipments of apples as well as export lots, and may be referred to as "U.S. Condition Standards".

Note: "Damage by water core" means externally invisible water core existing around the core and extending to water core in the vascular bundles; or surrounding the vascular bundles when the affected areas surrounding three or more vascular bundles meet or coalesce; or existing in more than slight degree outside the circular area formed by the vascular bundles; or any externally visible water core.

- (b) Not more than 5 percent of the apples in any lot shall be damaged by storage scab.
- (c) Not more than a total of 5 percent of the apples in any lot shall be affected by scald, internal breakdown, freezing injury, or decay; or damaged by water core, bitter pit, Jonathan spot, or other condition factors: **Provided, That:**
 - (1) Not more than a total of 2 percent shall be allowed for apples affected by decay and soft scald;
 - (2) Not more than 2 percent shall be allowed for apples affected by internal breakdown; and,
 - (3) Not more than 2 percent shall be allowed for apples affected by slight scald.
- (d) Container packs shall comply with packing requirements specified in §51.311 of the United States Standards for Grades of Apples.
- (e) Any lot of apples shall be considered as meeting the U.S. Condition Standards for Export if the entire lot averages within the requirements specified: **Provided, That** no package in any lot shall have more than double the percentages specified, except that for packages which contain 10 pounds or less, individual packages in any lot may have not more than three times the tolerance or one apple (whichever is the greater amount).